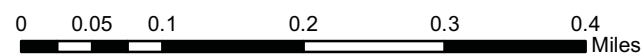


Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Shanley Creek Relocation

N1/2, Section 3, T15N, R13W to
SE1/4, Section 4, TN, R13W

Proposed Road = 1.42 miles



1 inch = 719 feet





Photos 1-2: Existing road and lower culvert to be removed



Photos 3-4: Upper culvert to be removed and unimproved ford proposed to be upgraded with a bridge

Shanely Creek Road Log

Directions: At MM 37.9 highway 200, turn left onto Woodworth Rd at the Blackfoot-Clearwater Game Range sign. After about 2 miles the road bends to the right, continue and at intersection with Upsete Lake Rd stay left on Woodworth Rd. Continue another mile until turning right at a silver gate. Go through gate (combo is 5581). Drive this main dirt road for about 1/2 mile. Take dirt road to the right at the beehives. Drive to where the road splits. This is the beginning of the project.

General Notes: 14' road, plus fill widening, turnpike/ditch as needed, (road travels through low lands that hold water, turnpike and elevate to get above water level), dips as needed or as per plan, turnouts every ¼ mile or as needed, pile all slash/stumps in burnable dirt free piles as possible, see all culverts (seed ordered), place slash filter windrows on all large fills, armor inlet/outlet of CMPs.

Road Log

New Shanely Creek Road

0+00 Begin road reconditioning at road split. Widen and turnpike/ditch. Crown running surface.
3+08 Install wooden bridge (see attached design plan)
4+68 Recondition existing road. Widen and crown running surface.
6+13 Continue reconditioning
6+94 Begin turning 80' radius into new construction and construction intersection with existing road.
7+89 New road construction. Turnpike/ditch and crown running surface. Continue new road construction to 13+13
13+13 Install 36" culvert on diversion ditch. Armor inlet/outlet.
14+41 New road construction. Turnpike/ditch and crown running surface. Continue new road construction to 17+67
17+67 Fence crossing. Remove current fence and install wire/log gate.
18+85 New road construction. Turnpike/ditch and crown running surface.
29+69 New road construction into tree line. Pile all slash/stumps in burnable dirt free piles as possible. Use slash for slash filter windrow when necessary on fill slopes.
29+69 Construct rolling dip
32+51 Construct rolling dip
36+67 Reconnect with existing road. Begin recondition of existing road. Turnpike/ditch, widen and crown running surface.
41+15 Continue reconditioning. Turnpike/ditch, widen and crown road.
47+91 Begin turn to approach of private land.
50+01 End of road reconditioning at private land boundary. Insure smooth road transition into private road.

Shanley Creek Crossing - A1

Survey and Profile

Shanley Creek profile - Crossing A1

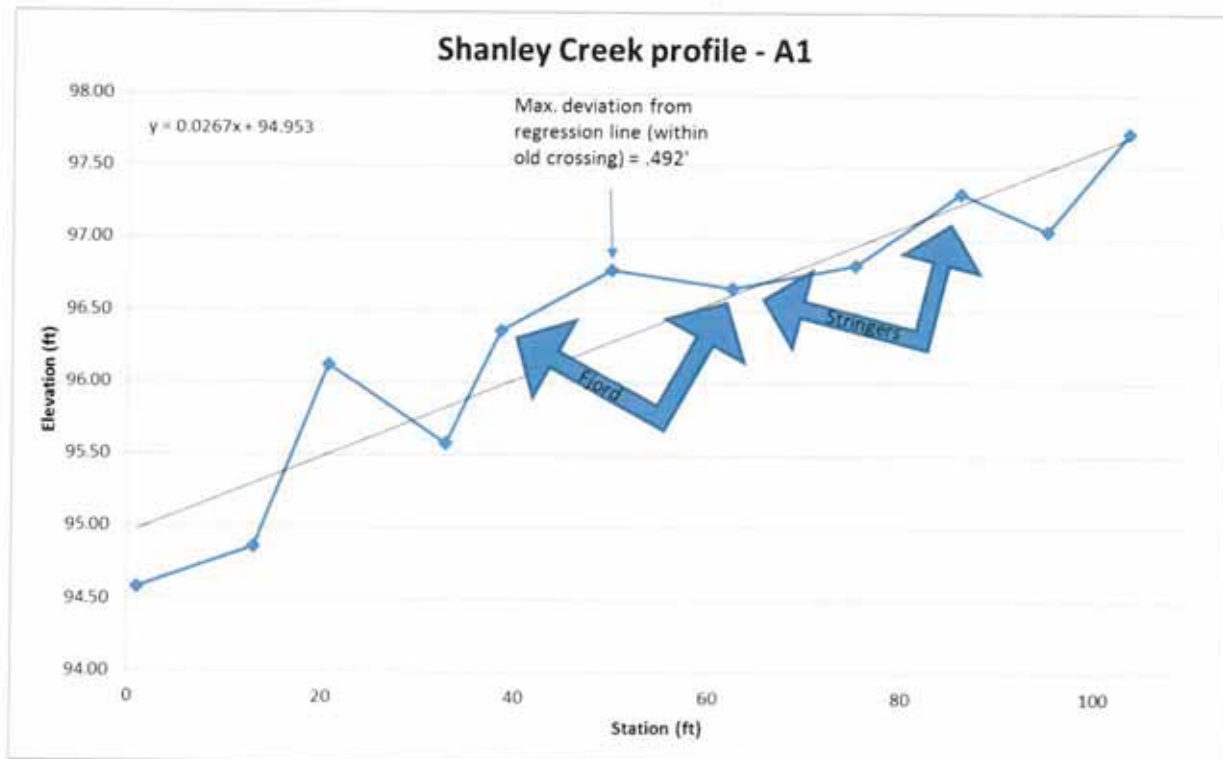
BM1= ~14" Spruce on LH side of bank, ~ 10' upstream from log stringers

BS1= 2.48

HI1= 102.48

BFW (based on average stream width of points not influenced by fford or stringers) 11.32

Station	Rod	Elevation	Bank width	Remark
1	7.9	94.58	7.9	Begin survey
13	7.62	94.86	17.3	
20.6	6.36	96.12	12	
32.8	6.9	95.58	12	DS end of fford influence
38.5	6.12	96.36	15.7	DS end of fford
50	5.7	96.78	29	center of fford
62.2	5.82	96.66	11	DS end of log stringers/US end of fford
75	5.66	96.82	10	mid-stringers
86	5.16	97.32	14.3	US end of log stringers
95	5.42	97.06	9.5	
103.3	4.74	97.74	9.9	End of survey - end of bend in creek



Shanley Creek Road Decommission

Road Overview

Below is the proposed plan to decommission the old road on Bandy Ranch paralleling Shanley Creek. The purpose of this decommission is to restore the Shanley creek floodplain, prevent erosion and promote ecosystem health in the surrounding area. The total length of the road is 5035 feet (.95 miles). No more than a 3% grade was measured along the length of the road. Also, the driving surface of the road is rough with poor drainage. The first 621 feet(.12 mi) of the road leads up to the ford crossing intersection. From the ford intersection the road runs another 794 feet(.15) to the Bandy property line which is separated by a gate(station 14+15). The road runs parallel to the creek for another 3620 feet (.69 mi) past the entry gate and ends at the Bodecker property boundary. There are three culverts along the road to remove (stations 15+37/19+17/21+88). There is also a seep on the uphill side of the road at station 39+44. Cattle grazing is heavy in the area and needs to be accounted for in restoration efforts. Fencing the area off from cattle until new growth is established is the best option.

Decommission Options

- **Patching: (stations 0-6+21)** The first .12 miles of road leading up to the ford can be patched to a suitable road quality. This can be done using fill removed when pulling the culverts.
- **Drainage dip: (station 7+50)** To prevent a major puddle in the intersection of station 6+21, a large drainage dip in this location (between ford intersection and Bandy property gate) would redirect water into the irrigation canal on the downhill side of the road, maintaining quality of existing road.
- **Ripping: (stations 6+21-39+44)** Due to the gentle slope of this road, ripping the roadbed is the best option for removal. Ripping the roadbed reduces long-term erosion, increases infiltration rates of water, discourage weed establishment and promotes vegetation growth.
 - **Alternative: (Blockade)** A alternative to ripping the road surface here would be to set up a blockade to keep ATV traffic from using the road. Although a machine will be in the area to remove culverts, this may be cost efficient. The road drainage would remain poor for quite some time and take longer for the compact soils to revegetate.
- **Partial Recontouring: (Stations 39+44-50+35)** Partial recontouring would be beneficial along this section to prevent erosion and landslides on the cut slope and reduce probability of high sediment exposure to the stream in flood events. The maximum

grade along this portion of road is 3%. Pulling half of the road nearest the creek to partially recontour the slope would be beneficial. This does not necessarily need to be done along the whole section of road. Just where the road is nearest the stream.

- **Alternative:** Using a blockade to keep traffic from using this area would also be suitable.
- **Revegetation:** Planting vegetation along road after it is ripped will increase stability of the area and decrease the chance for erosion and heavy sedimentation of the stream in high water events. Grass seed, willows and aspen can be used to replant the area.
 - **Alternative:** Allowing the area to naturally revegetate itself over time is another option. This may take longer and the area would have to remain fenced off from cattle for a longer period of time to allow growth.
- **Culverts:** Remove three culverts for stream restoration. See culvert removal plans.

Above the first culvert there is a manmade berm to also be removed. This will allow the stream to follow its natural path over time. The fill from the berm can be used to patch the entrance road (station 0-6+21).
- **Seep: (station 39+44)** A small seep on the uphill side of the road is creating a small puddle in the roadway. The road is on a 2% grade along this area. Starting to recontour the road at this point and allowing the seep to take its natural course of action may be efficient. A drainage dip may also aid natural process.
 - **Alternative:** A alternative is to leave the seep be and allow it run its natural course.

Old Shanley Creek Road Log

Directions: At mile marker 38 on highway 200 turn left onto Woodworth Road. There is a sign at the turnoff for the Blackfoot-Clearwater Game Range. Follow Woodworth road for about 3 miles. Turn right at the unmarked silver gate and go through. Follow this dirt road for about a ½ mile until arriving at an intersection with beehives. This intersection will be station 0.

Road Log

0. Beginning of road at beehive intersection. 14' road along this section

6+21-Intersection of old road and the road that crosses the ford. Recondition old road up to this point by patching. Decommission the rest of the road from this point forward.

7+50- Location for possible drainage dip. This area needs a drainage dip to route water into the irrigation canal and prevent heavy puddling at station 6+21. Continue decommission

14+15- Entrance gate at the Bandy property line. Road begins to narrow at this point.

15+37- First culvert to be removed. Large manmade berm on the outside of the stream channel above this culvert that needs to be removed.

19+17- Second culvert to be removed.

21+88- Old road leading to third culvert to be removed. Decommission.

33+53- Intersection of old road and road that leaves the Shanley flood plain.

39+44- Area of seep on road with a 2% grade. Possibly improve seep drainage start recontouring efforts.

45+93- Possible partial recontour area for erosion control.

50+35- End of old road. Bodecker property gate.

Culvert 1 Removal

Introduction

Under the road that is no longer being used, the existing culvert will be removed. To implant this pipe, the stream course was changed by building a new bank for that stream. However, the area surrounded by the stream became a wetland. Also the new bank of the stream is causing erosion and putting sedimentation on the upstream area, causing an aggraded on that stream.

Objective

The purpose of this removal is to recover the vegetation and to establish a natural river flow in the immediate area. The material will be moved away from the crossing and deposited in stable sites to prevent crossing failure and soil delivery directly into streams.

Location

The culvert is located at station number 9+13 of the decommissioned road.

Description

The type of culvert being removed is a squash corrugated metal pipe (CMP); as shown on the attached profile and plan sketch (figure 1 and 2), it is approximately 55 inches x 40 inches x 20 feet. The length of fill from culvert to the right facing upstream is 20 feet at -2% slope, and the left facing upstream is 28 feet at -3% slope. The depth of fill over the pipe is 12 inches in the inlet and outlet. The width of the fill along the road centerline and perpendicular to the culvert axis is 18 feet. The width of flood prone channel is 10 feet. The road width over the culvert is 14 feet.

Proposal

For the removal operation of the culvert and excess fill material, an excavator will be used to remove and to relocate the excavated material which can be used to build a new road or used to re-contour the existing road. The area that will be excavated will have approximately 16.15 yd³ of material.

The stream will not be reallocated to its original course because this plan would be extremely expensive. The excavator will be also used to remove some of the sediments on the upstream. This operation will cause some impacts on the stream immediately; however, after the work is complete, the stream will heal itself and will soon be back to its natural state and velocity. The upstream bank will be recovered by re-grading the slope to a more stable angle, and pulling out some of the trees that are too close to the stream.

Rocks will be used as way to prevent erosion in conjunction with planting grass seed for the recovery of vegetation. Some of the rocks that will be pulled out from the culvert can be used; however, there are some big rocks that can't be used to create an armored slope on the banks. The natural knickpoints should be preserved in the streambed, such as bedrock or large woody debris to help protect against gully formation. The finished stream channel should be free of large rock and woody debris; although natural, these obstructions will divert flow into the soft banks of the crossing.

Finally, the area around the stream will be fenced to protect it from cattle that surround that area. Cattle cause erosion in just a short time making it difficult to establish any vegetation.

Second Culvert Removal:

Memo:

In the Bandy property, there is an old road that need to be removed and a new road will be built to facilitate the access to the area and to minimize the damage of the stream. Since the old road is located close to the stream and there are 3 culverts to be removed. The goals of removing the culverts are putting the stream in its original curse and to recover the vegetation around the stream. The stream still have the same curse but it is necessary to avoid that the sedimentation goes to the stream. Excavator will remove the second culvert and excess fill material. To keep the sedimentation out of the stream and to recover the soil around it, the cheapest way is putting rocks and grass seed. Also, to avoid the cows to go the stream, it is possible to put a fence in the area, rocks or slashes. Therefore, it will also help the stream keeping the sediments out and to have less erosion on the soil.

Location:

The location of the second culvert is the station 12+96 in the old road.

Description:

The characteristics of the culvert is length of the culvert is 16 feet and the grade of downstream is 2%. The type of this culvert is squash pipe with 29 inches tall and 41 inches wide. This road has 9 feet of length of fill; 11 feet of road width; 13 feet of Bank Full Width; 13 inches of depth of fill inlet and outlet.

Proposal:

For the removal of the second culvert, an excavator will be used to remove it. With the fill removed of the road, this fill can be placed to build the new road or it can be placed in the re-contour of the old road. The estimated excess fill is 232.325 cubic feet. In the area around the culvert, one alternative to recover the soil and improve the quality of the stream is planting grass seed in the area and putting some rocks to stabilize the stream. With that, it is possible to minimize the erosion in that soil around of the stream. Also, it is necessary to avoid the cows around in the area, by putting fence or rocks to protect the stream. There are some existing rocks next to the culvert, so these rocks can stay there to avoid the erosion and cost less money to place more rocks in the bank.

Culvert 3 Removal:

Objectives: Access to the portion of Bandy Ranch north of Shanley Creek is provided via the new road constructed as part of the Jump Start project. Therefore, the road at this stream crossing is no longer in use and will be decommissioned. Since this road will no longer be maintained, the culvert needs to be removed. The general objective of this culvert removal is to restore natural stream flow and shape of the stream corridor and floodplain at the stream crossing site to closely match the existing natural stream corridor. In addition, this will stabilize and protect the stream corridor in the immediate vicinity of the culvert to prevent excess erosion.

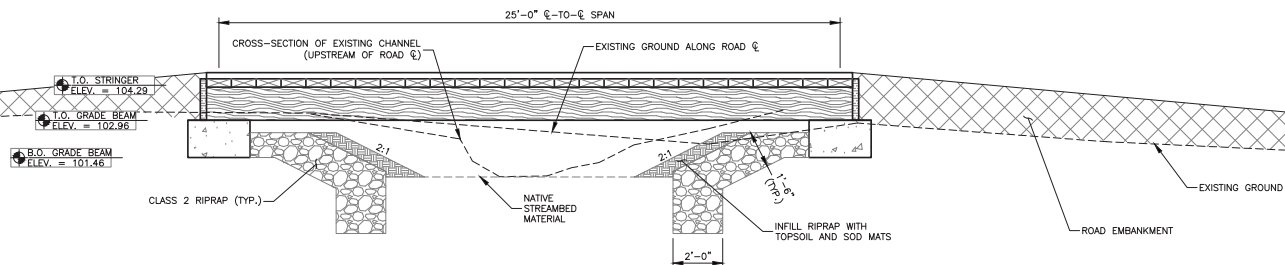
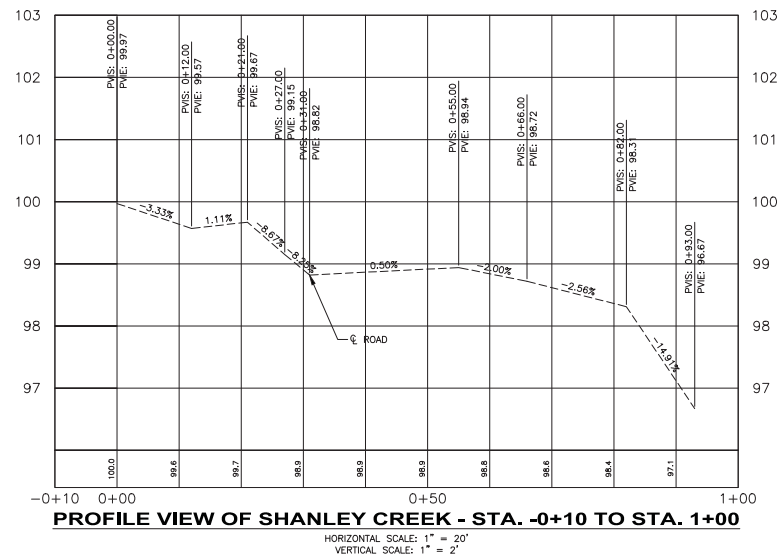
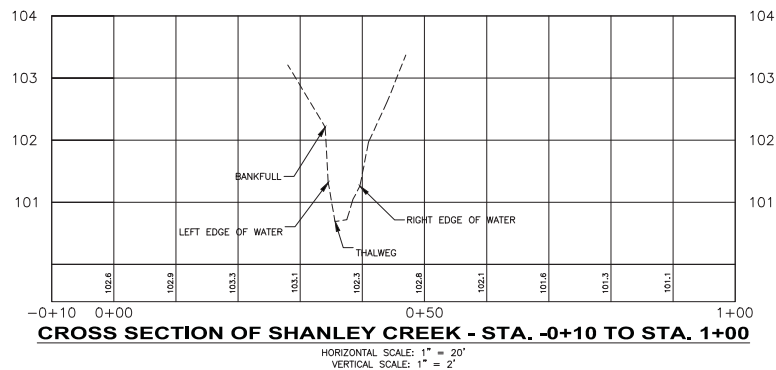
Location: This culvert is located on a short spur road which intersects with the main road at station 15+67. The culvert location is at station 1+63 on the spur road from the intersection of the main road. Shanley Creek is a perennial stream. By state law a 124 permit will need to be submitted before work begins.

Description: This culvert is a squash CMP approximately 38 inches x 57 inches x 18 feet. The culvert appears to be sloped correctly to match the slope of the stream (~3%). The depth of fill over the CMP is between 13 and 18 inches. The road width at the stream crossing is 9.5 feet. The length of through fill at the crossing is 32 feet. The approximate bank full width of the stream is 13 feet. A profile and plan sketch of the current crossing are attached.

Proposed Action: Water will need to be diverted around the crossing while the culvert is being removed. Approximately 29 cu. yd. of excess fill material will be excavated and removed from the stream crossing site. This fill material can be used for construction of the new road if needed or dumped somewhere away from the stream corridor. If the fill material is to be dumped, the material should be leveled at the dump site and seeded with grass to help prevent it from

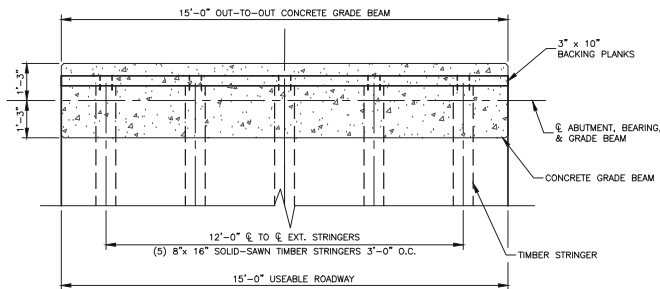
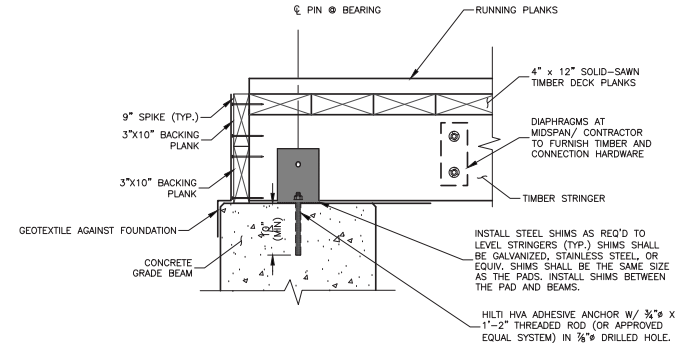
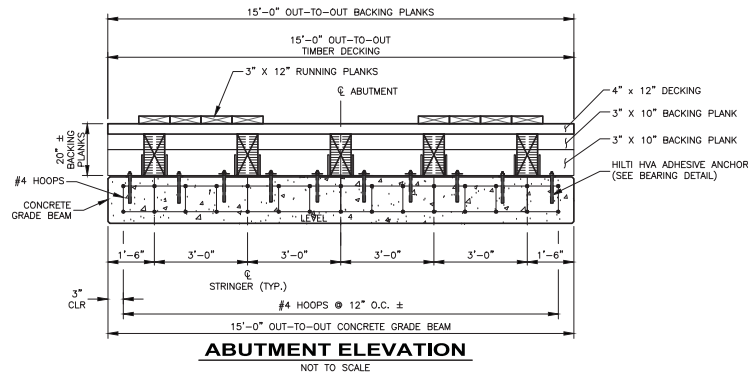
potentially being moved back toward the stream corridor. There is at least one log buried parallel and adjacent to the culvert that should also be removed. The old culvert will be pulled and if necessary the stream bed below the old culvert should be modified to match the natural stream grade (~3%) and bank full width (13 feet). This is likely to not be necessary since the culvert grade matches the stream grade. The stream corridor at the crossing will also be modified to closely match the natural corridor after excavation of fill material (see profile view attached). Rocks and gravel will also be placed in the restored stream bed and bank as armoring to prevent excess erosion.

The spur road leading to the stream crossing and 30 feet after the crossing will be ripped to decompact the running surface. Grass seed mix will be planted over the old spur road leading to and following the crossing as well as around the crossing itself to re-vegetate the bare soil. Slash will be scattered across the decompacted road surface to help prevent erosion and cattle traffic while the grass establishes. Sedge seed and willow clippings may also be planted at the crossing site to mimic natural stream vegetation. Erosion control features (biodegradable wattles and mats) will also be placed at the site to help temporarily stabilize the exposed soil while the new vegetation establishes. Wattles will be placed in shallow cup trenches parallel and adjacent to the stream bank full line. Mats will be placed over the exposed soil at the excavation site. Temporary fencing of the stream crossing is strongly recommended to prevent cattle from utilizing the site as a stream crossing, which would cause excess erosion and damage the stream corridor structure before new vegetation can be established.



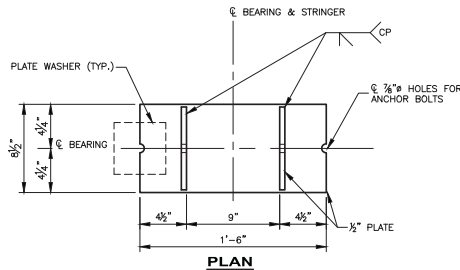
PROFILE AND SECTION VIEWS

BIG BLACKFOOT CHAPTER TROUT UNLIMITED
SHANLEY CREEK CROSSING

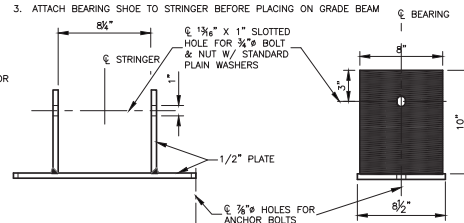


NOTES:

1. PLACE PLATE WASHER ON TOP OF CONSECUTIVE BEARING SHOES TO HOLD BEARING SHOES IN PLACE.
2. EXTERIOR BEARING SHOES SHALL EXTEND AN ADDITIONAL 2" ALONG THE GRADE BEAM AND HAVE A COMPLETE ANCHOR BOLT HOLE TO SECURE IT IN PLACE.
3. ATTACH BEARING SHOE TO STRINGER BEFORE PLACING ON GRADE BEAM



**ELEVATION
BEARING SHOE DETAIL**
NOT TO SCALE



SIDE VIEW

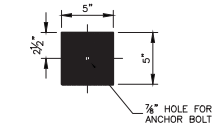
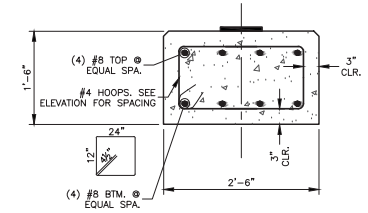


PLATE WASHER



FOUNDATION DETAIL
NOT TO SCALE

BRIDGE DETAILS

BIG BLACKFOOT CHAPTER TROUT UNLIMITED
SHANLEY CREEK CROSSING

